

Listing of Claims

1. (Currently Amended) An MR method for generating an MR image ~~(11)~~ of an object situated in an examination volume of an MR apparatus, which method has the following steps:
 - a) acquisition of a plurality of echo signals having at least two different echo-time values ~~(t_1, t_2, t_3)~~, the echo signals being generated from high-frequency pulses and magnetic-field gradient pulses by means of an imaging sequence,
 - b) reconstruction from the corresponding echo signals of one intermediate MR image ~~(5, 6, 7)~~ for each echo-time value ~~(t_1, t_2, t_3)~~,
 - c) determination of local relaxation times ~~($T_2^*(x)$)~~ and/or local frequency shifts ~~($\Delta\omega(x)$)~~ by analyzing the intermediate MR images while taking account of the respective echo-time values ~~(t_1, t_2, t_3)~~,
 - d) reconstruction of a definitive MR image ~~(11)~~ from the echo signals ~~(1)~~ in their entirety.

2. (Currently Amended) An MR method as claimed in claim 1, ~~characterized in that~~ wherein, in step a) of the method, the acquisition of the echo signals takes place by non-Cartesian, and in particular radial, sampling of the spatial frequency space associated with the examination volume.

3. (Currently Amended) An MR method as claimed in claim 2, ~~characterized in that~~ wherein the intermediate MR images ~~(5, 6, 7)~~ are reconstructed at a lower resolution than the definitive MR image ~~(11)~~.

4. (Currently Amended) An MR method as claimed in ~~any of~~ claims 1 ~~to~~ 3, ~~characterized in that~~ wherein the imaging sequence is an echo planar imaging (EPI) sequence.

5. (Currently Amended) An MR method as claimed in ~~any of~~ claims 1 ~~to~~ 4, ~~characterized in that~~ wherein the local relaxation times ~~($T_2^*(x)$)~~ and/or local frequency shifts ~~($\Delta\omega(x)$)~~ that are determined are used to correct image artifacts caused by relaxation phenomena and/or field inhomogeneities in the definitive MR image ~~(11)~~.

6. (Currently Amended) An MR method in particular as claimed in claim 5, ~~characterized in that~~wherein the values of local relaxation times ($T_2^*(x)$) and values of local frequency shifts ($\Delta\omega(x)$) that are determined are used to correct image artifacts caused by relaxation phenomena and field inhomogeneities in an MR image (11), with a complex-variable local frequency shift ($\Delta\omega'(x)$) in accordance with the formula being used as a basis:

$$\Delta\omega'(x) = \Delta\omega(x) - \frac{i}{T_2^*(x)}.$$

7. (Currently Amended) An MR method as claimed in ~~any of the foregoing~~ claims 1, ~~characterized in that~~wherein a representation of the local relaxation times ($T_2^*(x)$) is superimposed on a representation of the definitive MR image for the purposes of display.

8. (Currently Amended) An MR apparatus having a main field coil (12) for generating a homogeneous static magnetic field in an examination volume, a plurality of gradient coils (14, 15, 16) for generating magnetic field gradients in the examination volume, at least one high-frequency coil (19) for generating high-frequency fields in the examination volume and for receiving echo signals from the examination volume, and a central control unit (17) for operating the gradient coils (14, 15, 16) and the high-frequency coil (19), plus a reconstruction and display unit (22) for processing and showing the echo signals, ~~characterized in that~~wherein the central control unit (17) and the reconstruction and display unit (22) have a programmed control means that operates by the method claimed in ~~any of~~ claims 1 to 7.

9. (Currently Amended) A computer program for an MR apparatus as claimed in claim 8, ~~characterized in that~~wherein a method as claimed in ~~any of~~ claims 1 to 7 is implemented on the central control unit (17) and the reconstruction and display unit (22) by the computer program.